

This listing of claims will replace all prior versions, and listings, of claims in the application:

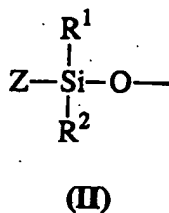
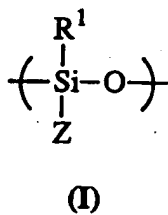
Listing of Claims:

1. (Currently Amended) A method for thermal insulation, ~~characterized in that it comprises~~comprising:
 - positioning a gel formed ~~between~~from an insulating liquid base, which ~~may or may not be~~is a phase change material, and at least one gelling agent comprising at least one polysiloxane resin, which may or may not be modified, on a surface of an object to be insulated and
 - in situ ~~cross linking~~cross-linking of said polysiloxane resin.
2. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein said insulating liquid base is ~~selected from~~:
 - saturated or unsaturated, cyclic or non-cyclic aliphatic hydrocarbon bases;
 - aromatic hydrocarbon bases;
 - mixtures of aliphatic and aromatic fractions;
 - aliphatic ~~and/or~~ aromatic alcohols;
 - fatty acids, vegetable oils ~~and/or~~ animal oils; ~~and/or~~
 - halogenated compounds.
3. (Canceled)
4. (Currently Amended) A method according to claim 3~~1~~, ~~characterized in that~~wherein said insulating liquid base is a C₁₂ to C₆₀ paraffinic cut.
5. (Currently Amended) A method according to claim 4, ~~characterized in that~~wherein

said insulating liquid base is ~~selected from~~ long chain C₃₀ to C₄₀ n-paraffin waxes ~~and/or~~ long chain C₃₀ to C₄₀ isoparaffin waxes containing 1 or 2 branches.

6. (Currently Amended) A method according to claim 31, ~~characterized in that~~ wherein said insulating liquid base is ~~selected from~~ slightly branched alkyl chain alkylaromatics or alkylcycloalkanes, fatty alcohols ~~and/or~~ fatty acids.
7. (Currently Amended) A method according to claim 1, ~~characterized in that~~ wherein said insulating liquid base is a kerosene.
8. (Currently Amended) A method according to claim 1, ~~characterized in that~~ wherein said polysiloxane resin is ~~selected from~~:
- monomers containing a motif with formula (I) terminated by two motifs with formula (II);
 - oligomers with unitary motifs with formula (I) terminated by motifs with formula (II);
 - polymers comprising unitary motifs with formula (I) terminated by motifs with formula (II);
 - cyclic oligomers comprising unitary motifs with formula (I); ~~and/or~~
 - cyclic polymers comprising unitary motifs with formula (I);

formulae (I) and (II) being shown below:



in which formulae:

- symbols R^1 and R^2 , which are identical or different, each represent:
 - a linear or branched alkyl radical containing less than 30 carbon atoms, optionally substituted with at least one halogen;
 - a cycloalkyl radical containing 5 to 8 carbon atoms in the cycle, optionally substituted;
 - an aryl radical containing 6 to 12 carbon atoms, which may be substituted; or
 - any other alkylaromatic chain;
- symbols Z, which are identical or different, each represent:
 - a group R^1 and/or R^2 ;
 - a hydrogen radical;
 - a hydroxyl radical;
 - a vinyl radical ($-\text{CH}=\text{CH}_2$); or
 - a saturated or unsaturated, aliphatic or cyclic carbonaceous chain, which may or may not contain unsaturated bonds, which may or may not contain heteroatoms, which may or may not contain reactive chemical groups;

with at least one of symbols Z representing a cross-linkable group, ~~using one of the cross-linking modes defined below.~~

9. (Currently Amended) A method according to claim 1, ~~characterized in that~~ wherein said insulating liquid base represents 70% to 99.5% and said gelling agent represents 30% to 0.5% of the total weight of the mixture.

10. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein the mixture further comprises a compatibilizing agent between said insulating liquid base and said polysiloxane, the proportion of which is included in the proportion of gelling agent.
11. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein the gelling agent comprises at least one polyorganosiloxane terminated by hydroxyl functions and at least one silane containing alkoxy functions or carboxylate groups and cross-linking is carried out in the presence of an acid catalyst, a basic catalyst or a catalyst based on tin or titanium in the presence of traces of water acting as a co-catalyst.
12. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein the gelling agent comprises two functionalized polysiloxanes:
- a resin A containing vinylsilane functions (Si-CH=CH_2) which may be grafted;
 - and a resin B containing hydrosilane functions (Si-H);
- and in that cross-linking is carried out by hydrosilylation.
13. (Currently Amended) A method according to claim 12, ~~characterized in that~~wherein the proportions of resins A and B are such that the mole ratio between the hydrosilane groups from resin B and the vinylsilane groups from resin A is 0.8 to 1.4.
14. (Currently Amended) A method according to claim 12, ~~characterized in that~~wherein the mixture comprises a hydrosilylation catalyst.
15. (Currently Amended) A method according to claim 12, ~~characterized in that~~wherein said insulating liquid base generally represents 50% to 99.5% of the total mixture weight and the gelling agent represents 0.5% to 50%.

16. (Currently Amended) A method according to claim 15, ~~characterized in that~~wherein said insulating liquid base represents 70% to 98% and said gelling agent represents 2% to 30% of the total mass of the mixture.
17. (Currently Amended) A method according to claims 12, ~~characterized in that~~wherein the mixture further comprises a compatibilizing agent between said insulating liquid base and said polysiloxane, the proportion of which is included in the proportion of gelling agent.
18. (Currently Amended) A method according to claim 12, ~~characterized in that~~wherein said insulating liquid base is a C₁₂ to C₆₀ paraffinic cut, the proportion of gelling agent, which includes that of the compatibilizing agent, is 7% to 30% by weight, in which the compatibilizing agent represents a proportion of 10% to 40% by weight.
19. (Currently Amended) A method according to claim 18, ~~characterized in that~~wherein said insulating liquid base is a C₁₄ to C₂₀ paraffinic cut and the compatibilizing agent is octadec-1-ene.
20. (Currently Amended) A method according to claim 12, ~~characterized in that~~wherein said insulating liquid base is a kerosene and in that the gelling agent represents 5% to 30% by weight of the mixture.
21. (Currently Amended) A method according to claim 1, ~~characterized in that the positioning~~wherein the mixture has a time before gellingfor said mixture is regulated by the temperature, the nature and the proportion of resin in said mixture and by the nature and concentration of any catalyst in said mixture.
22. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein

the mixture further comprises at least one additive selected from antioxidant additives, antibacterial agents, corrosion inhibitors, anti-foaming agents and colorants, which are soluble in the insulating liquid base.

23. (Currently Amended) A method according to claim 1, ~~characterized in that~~wherein the mixture further comprises at least one filler ~~selected from hollow~~which is glass microbeads, fly ash, macrobeads ~~and/or~~ hollow fibres.
24. (Currently Amended) A method ~~according to claim 1, characterized in that~~for insulating a flowline or a pipeline or a singularity on a flowline or pipeline, ~~is insulated~~comprising
- positioning a gel formed from an insulating liquid base, which is a phase change material, and at least one gelling agent comprising at least one polysiloxane resin, which may or may not be modified, on a surface of the flowline or pipeline to be insulated and
 - in situ cross-linking of said polysiloxane resin.
25. (Currently Amended) A method according to claim 24, ~~characterized in that~~comprising insulating an ultradeep pipeline ~~is insulated~~ for temperatures of 2°C to 200°C.
26. (Currently Amended) A method according to claim 24, ~~characterized in that~~wherein the mixture is applied as a coating to the flowline to be thermally insulated.
27. (Currently Amended) A method according to claim 24, ~~characterized in that~~wherein the mixture is interposed between the flowline and a protective external jacket.
28. (Currently Amended) A method according to claim 24, ~~characterized in that~~wherein said singularity ~~consists of~~is a bend, a tee, a valve or an automatic connector.

29. (Currently Amended) A method according to claim ~~28~~27, ~~characterized in that~~wherein the singularity is on a flowline already in place on the seabed; a vacuum is created in said jacket to purge as much water as possible that it may contain; the mixture is injected into the jacket to inflate it and to create the desired insulation around said singularity.
30. (Previously Presented) A flowline or pipeline thermally insulated by a method according to claim 23.
31. (Currently Amended) A cross-linkable formulation for use in a method according to claim 1, ~~characterized in that it comprises~~comprising a mixture of an insulating liquid base, which ~~may or may not be~~is a phase change material, and at least one gelling agent comprising at least one polysiloxane, which may or may not be modified.
32. (Currently Amended) An insulating gel formulation according to claim 31, ~~characterized in that~~wherein the mixture further comprises a compatibilizing agent between said insulating liquid base and said polysiloxane.
33. (Currently Amended) An insulating gel formulation according to claim 31, ~~characterized in that~~wherein the gelling agent comprises two functionalized polysiloxane resins:
- a resin A containing vinylsilane functions (Si-CH=CH₂) which may be grafted;
 - and a resin B containing hydrosilane functions (Si-H).
34. (Currently Amended) A process for producing an insulating gel from a formulation according to claim 31, ~~characterized in that~~comprising subjecting said formulation ~~is subjected to~~ cross-linking conditions.

35. (Currently Amended) A process according to claim 34, ~~characterized in that in step a),~~wherein a compatibilizing agent acting between said insulating liquid base and said polysiloxane is employed.
36. (Currently Amended) A process according to claim 34, ~~characterized in that~~wherein the gelling agent comprises two functionalized polysiloxanes:
- a resin A containing vinylsilane functions (Si-CH=CH₂) which may be grafted;
 - and a resin B containing hydrosilane functions (Si-H);
- and in that cross-linking is carried out by hydrosilylation.
37. (Currently Amended) An insulating gel, ~~characterized in that~~wherein it is formed from an insulating liquid base and at least one cross-linked polysiloxane resin.
38. (Canceled)
39. (Currently Amended) A flowline or pipeline thermally insulated using a gel according to claim ~~37~~31.
40. (Currently Amended) A flowline or pipeline according to claim 39, ~~characterized in that~~wherein said gel is applied to the flowline to be thermally insulated as a coating.
41. (Currently Amended) A flowline or pipeline according to claim 39, ~~characterized in that~~wherein said gel is interposed between the flowline and a protective external jacket.
42. (New) A method for thermal insulation, comprising:
- positioning a gel formed from an insulating liquid base, which is a phase change material, and at least one gelling agent comprising at least one polysiloxane resin, which may or may not be modified, on a surface of an object to be insulated and
 - in situ cross-linking of said polysiloxane resin,

wherein said insulating liquid base is:

- saturated or unsaturated, cyclic or non-cyclic aliphatic hydrocarbon bases;
- aromatic hydrocarbon bases;
- mixtures of aliphatic and aromatic fractions;

43. (New) A method for insulating a flowline or a pipeline or a singularity thereon, comprising:

- positioning a gel formed from an insulating liquid base, which is a phase change material, and at least one gelling agent comprising at least one polysiloxane resin, which may or may not be modified, on a surface of an object to be insulated and
- in situ cross-linking of said polysiloxane resin wherein said insulating liquid base is:
- saturated or unsaturated, cyclic or non-cyclic aliphatic hydrocarbon bases;
- aromatic hydrocarbon bases;
- mixtures of aliphatic and aromatic fractions;